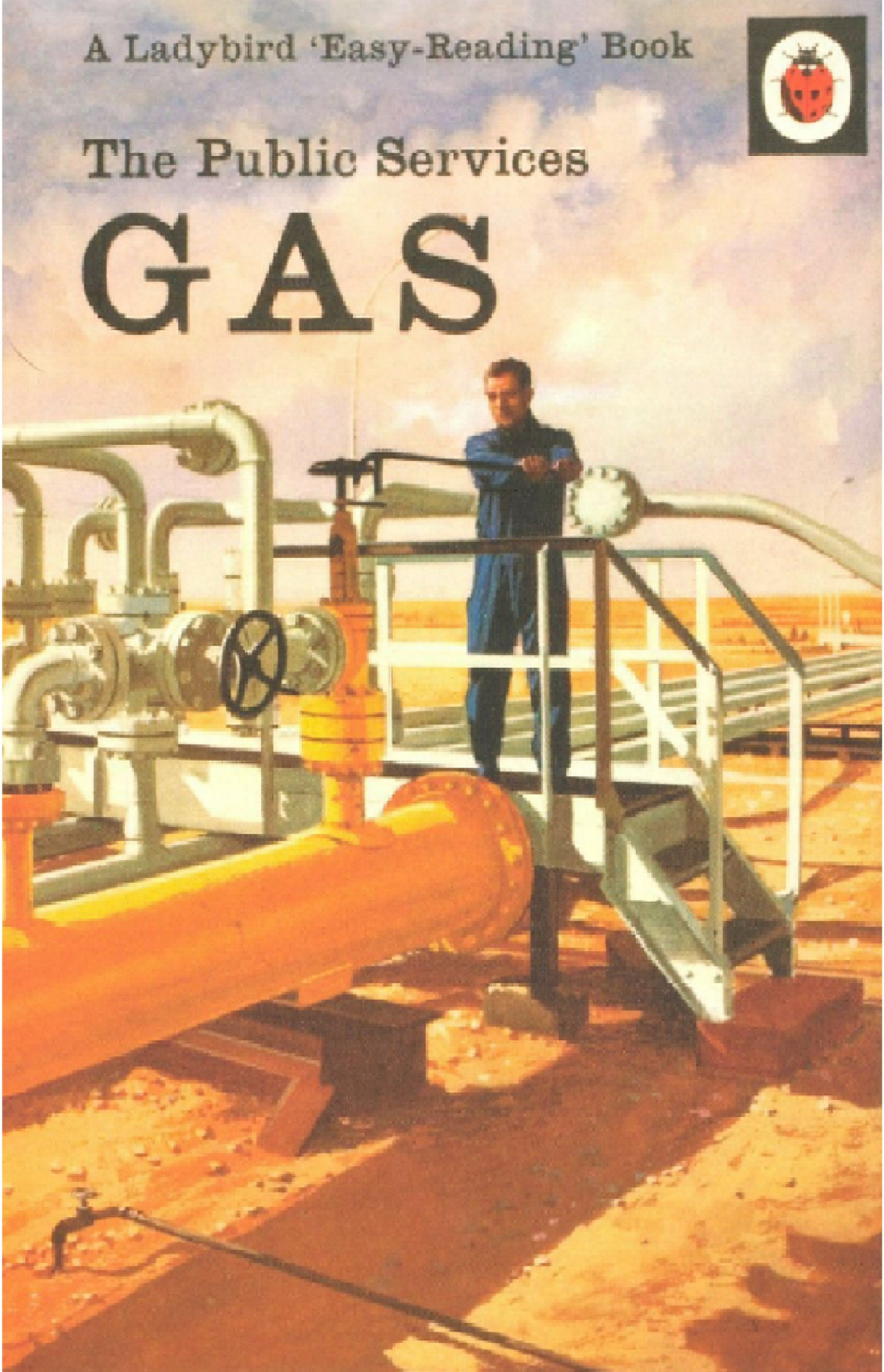
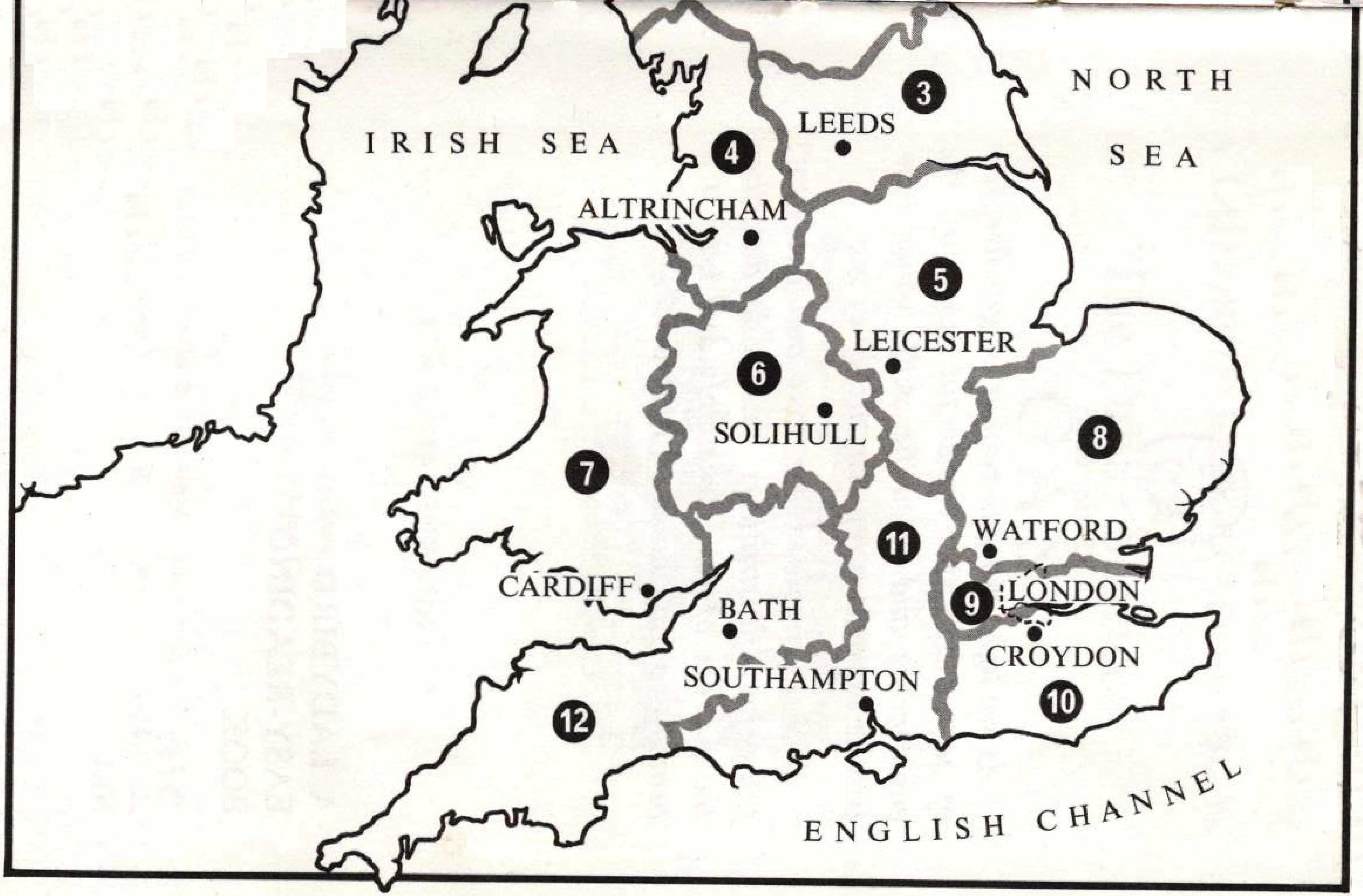
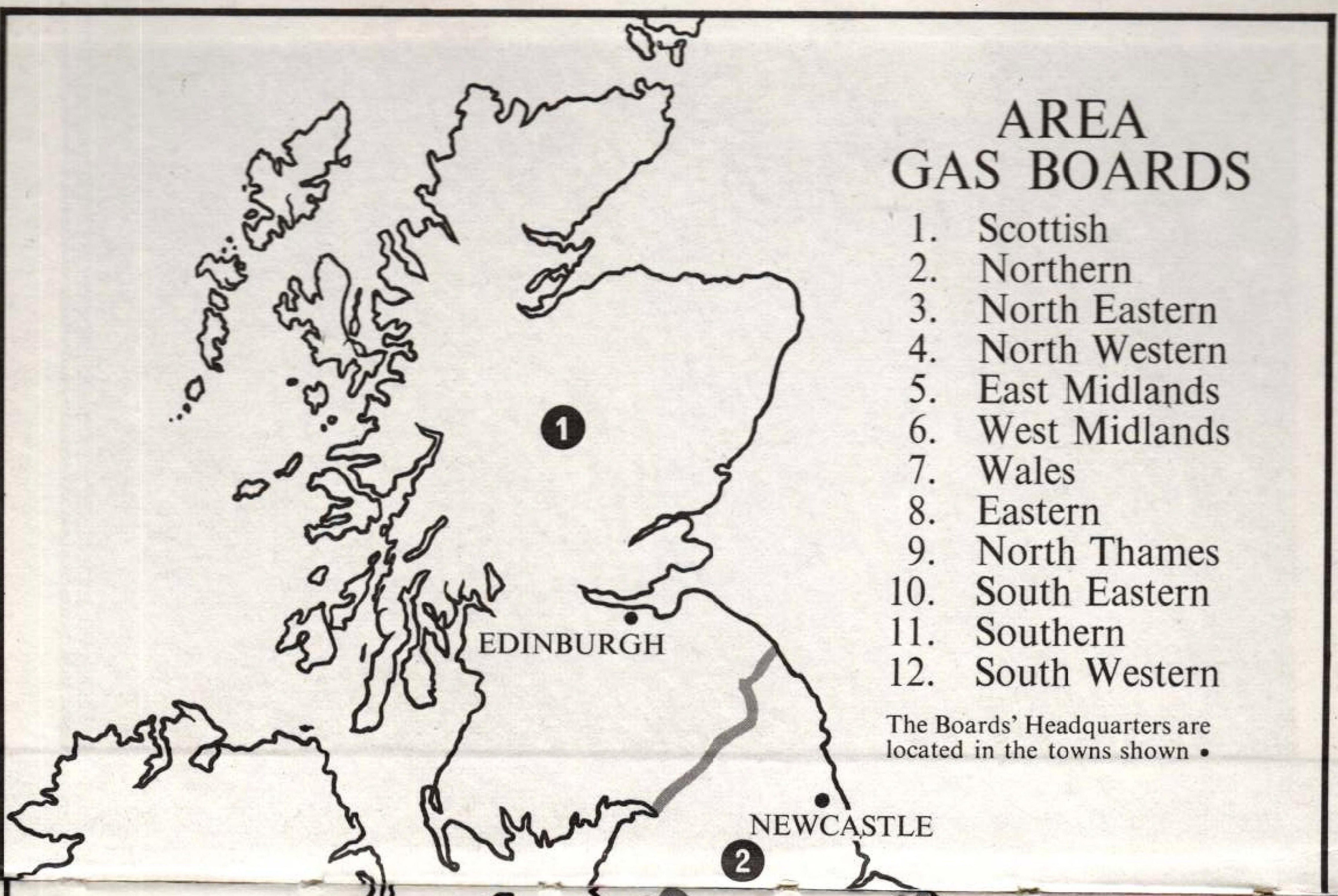
A Ladybird 'Easy-Reading' Book

The Public Services
GAS




NORTH SEA
IRISH SEA
3
LEEDS
4
ALTRINCHAM
5
LEICESTER
6
SOLIHULL
7
8
WATFORD
11
CARDIFF
9
LONDON
BATH
CROYDON
SOUTHAMPTON
10
12
ENGLISH CHANNEL



AREA GAS BOARDS

1. Scottish
2. Northern
3. North Eastern
4. North Western
5. East Midlands
6. West Midlands
7. Wales
8. Eastern
9. North Thames
10. South Eastern
11. Southern
12. South Western

The Boards' Headquarters are located in the towns shown •

Series 606E

As we light our gas-cooker or gas-fire, few of us realize the wonderful story of the engineering and scientific skills which contribute towards a regular supply of gas.

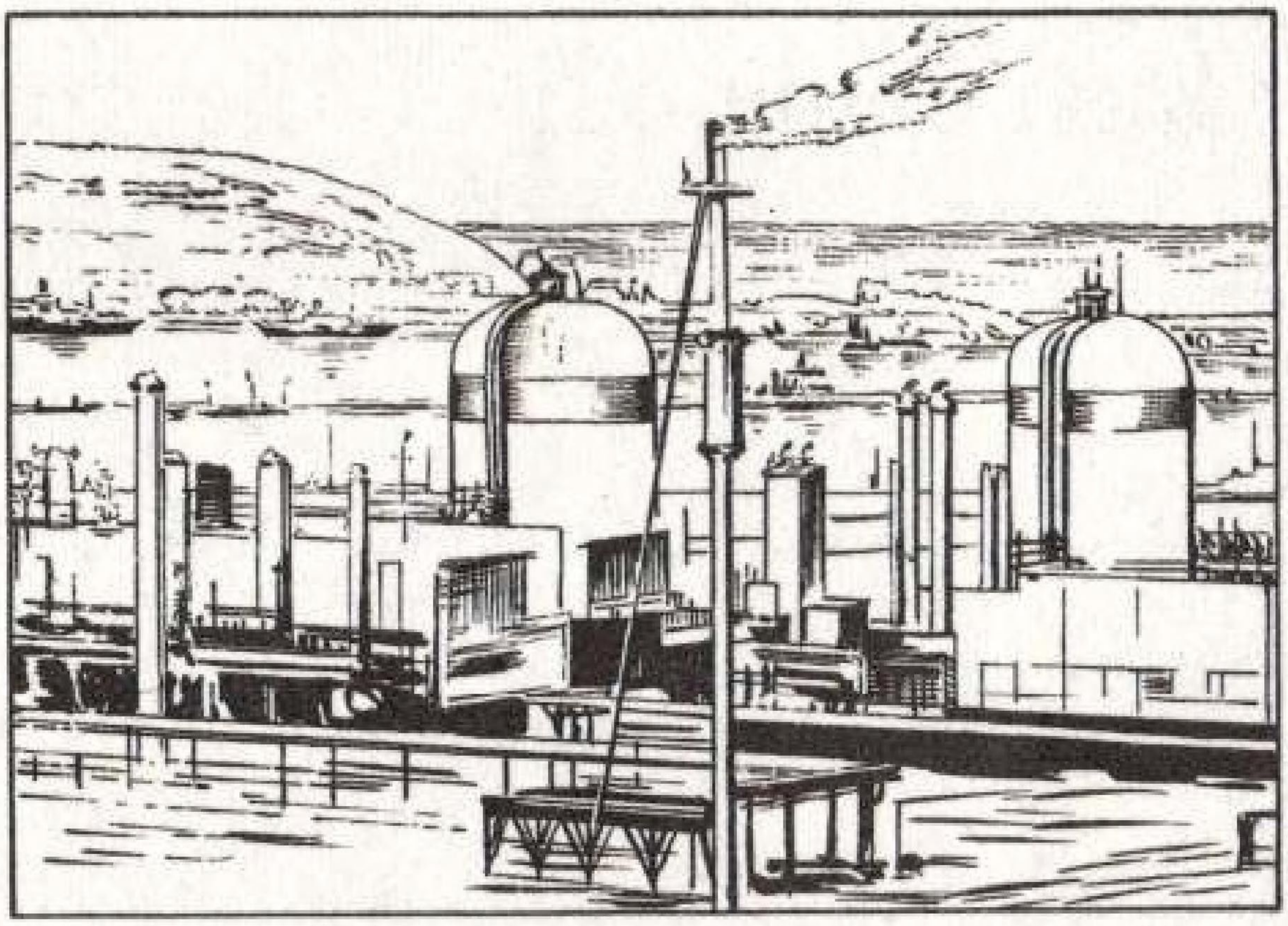
With a simple, clear text and excellent, full-colour illustrations, this book describes the sources of our gas supply and how it is brought to our homes and factories.

A LADYBIRD
EASY-READING
BOOK

2/6
NET

A LADYBIRD 'EASY-READING' BOOK

'The Public Services'
GAS



by

I. & J. HAVENHAND

with illustrations by

JOHN BERRY

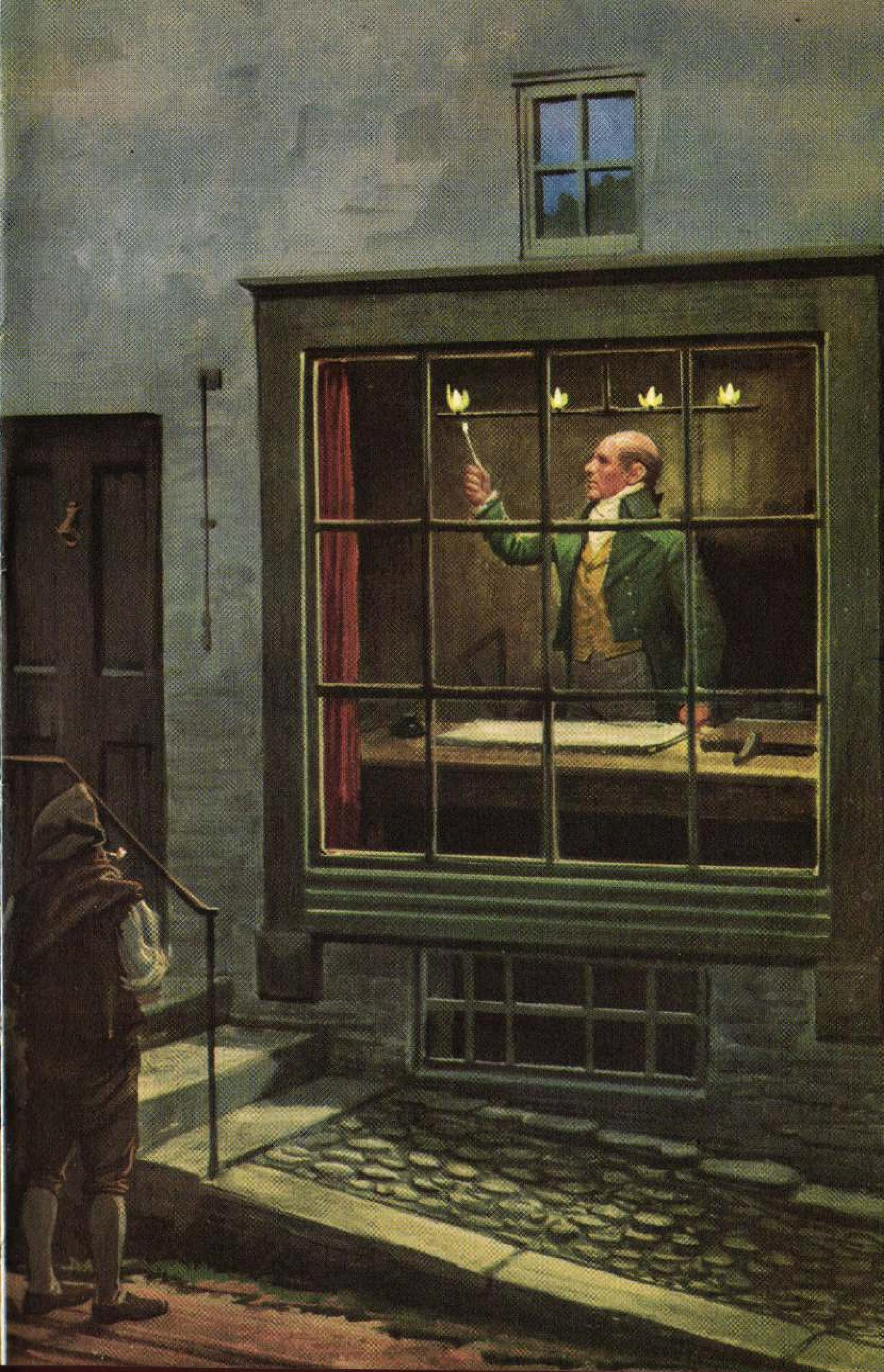
Publishers: Wills & Hepworth Ltd., Loughborough

First published 1967 © *Printed in England*

When you look at a coal fire you sometimes see little spurts of flame. These are really small jets of gas which come out of the hot coal and burn.

About two hundred years ago, a man called William Murdoch saw these gas flames. They gave him the idea of making gas.

He put some coal in a copper kettle and heated it on a fire. When gas came out of the spout he lit it. This made him think that he could use gas to light his house.



After William Murdoch had used gas to light his house, he used it to light the place where he worked.

Many people were so pleased with the lighting that they asked William Murdoch to light their factories with gas.

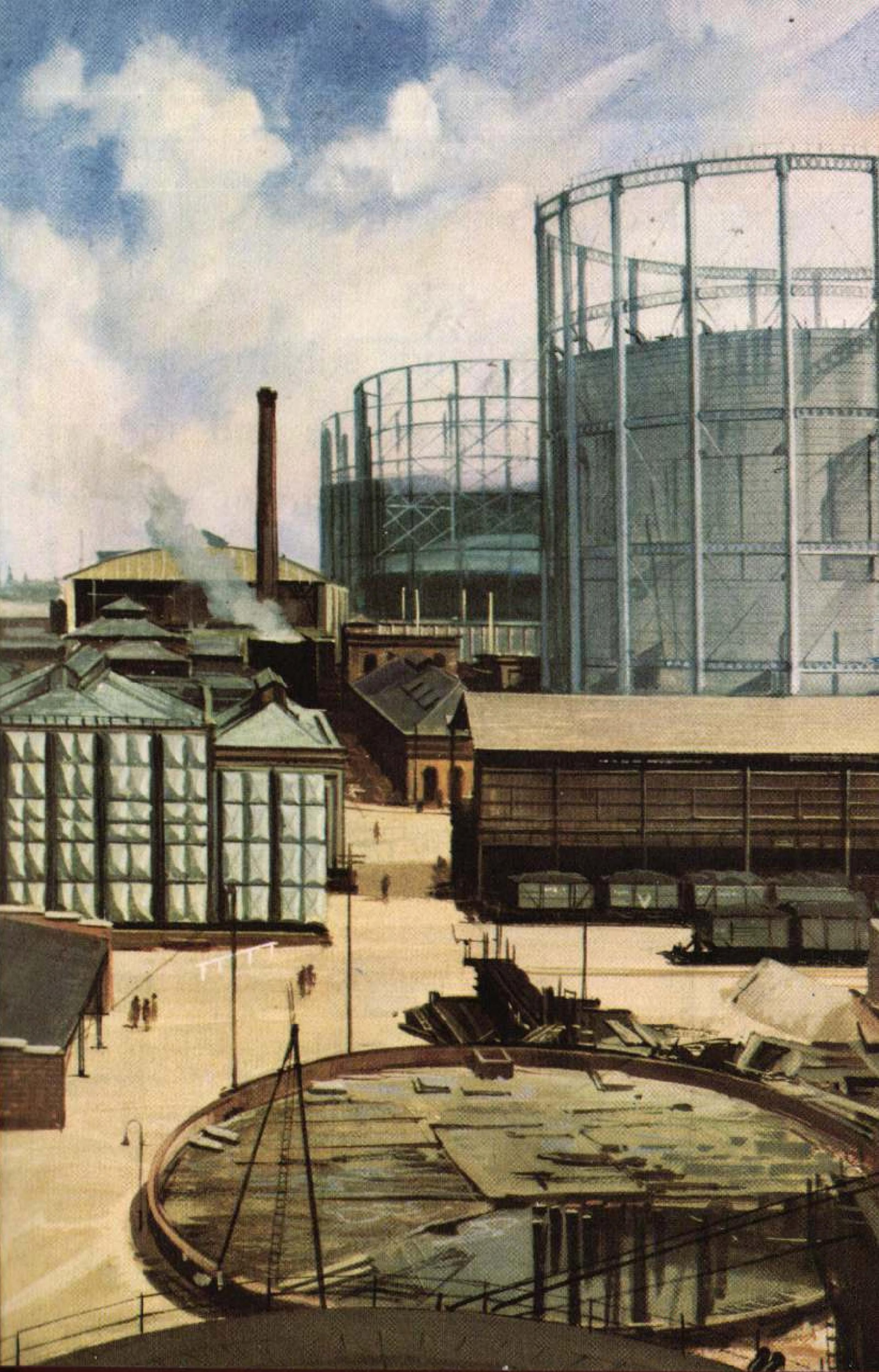
In 1808 some of the streets in London were lit by gas-lamps for the first time. The gas-lighting made it much safer for people to use the streets after dark. Robbers kept away from the gas-lit streets.

Soon, other towns lit their streets with gas-lamps.

It was soon found that gas could be burned to give heat as well as light. In 1840, the first gas-cooker was made and by 1855 some people had gas-fires in their homes.

As more gas was used, men had to build large gas-works in towns. There are still gas-works in some towns and coal is brought to them by rail.

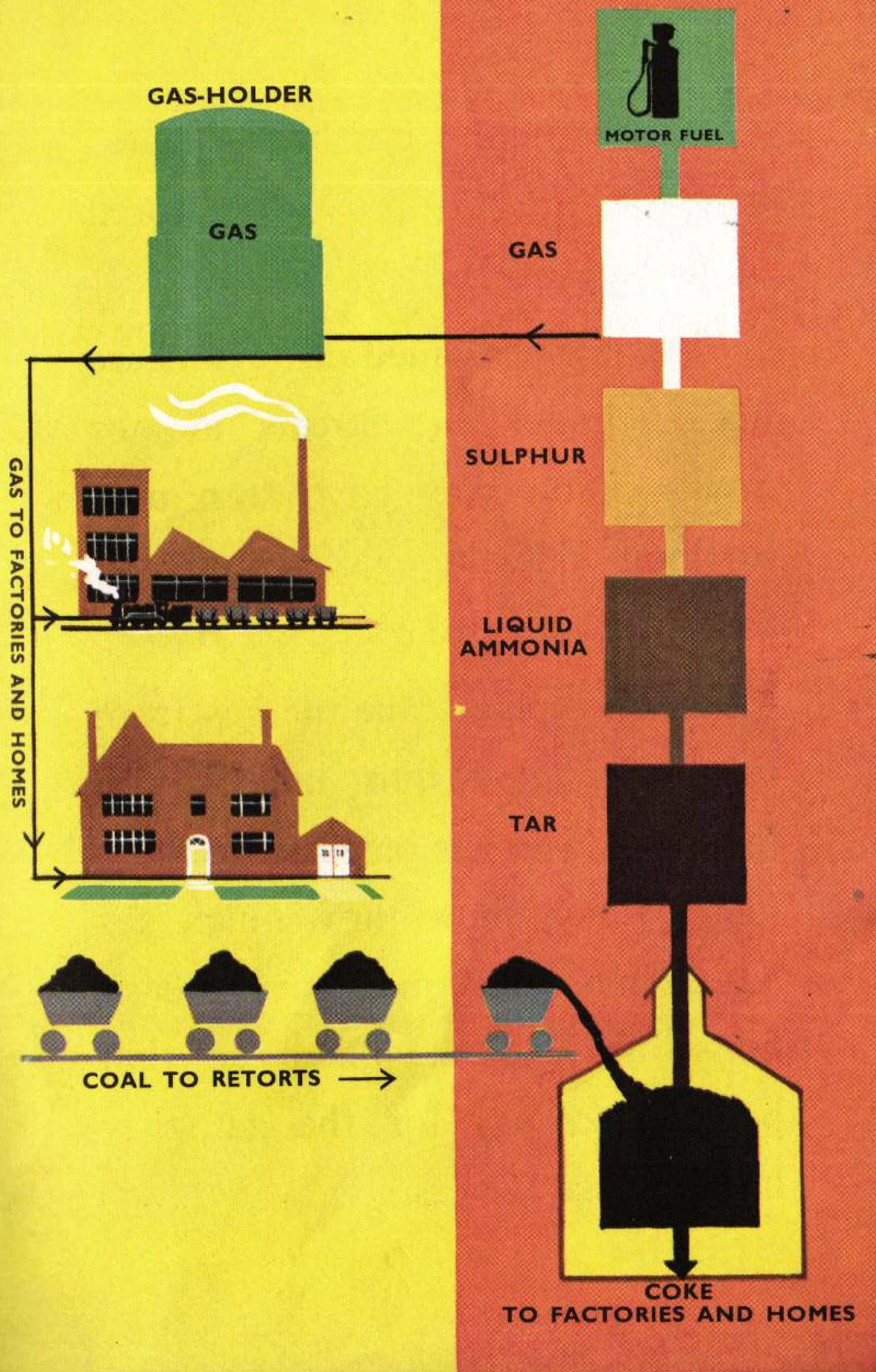
The coal is loaded into large ovens called retorts and is baked. The coal softens and sends off a thick, brown smoke.



The smoke from the retorts goes through pipes to the part of the gas-works where it is cleaned. Tar, ammonia and sulphur are washed from the smoke and the gas is left. This is called 'town' gas.

The tar, sulphur and ammonia are called by-products. They are made into fertilizers, plastics, nylon, medicines and many other things.

The coal that has no gas left in it is pushed out of the retorts. This is coke and can be burned instead of coal in boilers and stoves.


GAS-HOLDER
GAS
MOTOR FUEL
GAS
SULPHUR
LIQUID AMMONIA
TAR
GAS TO FACTORIES AND HOMES
COAL TO RETORTS
COKE
TO FACTORIES AND HOMES

When the gas has been cleaned it goes through pipes to be stored in gas-holders.

Large pipes called gas-mains are buried under the streets in our towns. You may have seen men working on the gas-mains and sometimes smelled gas.

Smaller pipes take the gas from the main pipe into houses and factories. The gas passes through a meter which shows how much gas has been used. A man goes to each house to read the meter so that people can pay for the gas they have used.

To-day, the kind of coal that makes good town gas is not very plentiful.

Scientists working for the Gas Council found a way of making gas from poor coal.

Two special gas-works, called Lurgi plants, were built to use the poor coal. No more Lurgi plants are now being built as still cheaper ways of getting gas have been discovered.

As a result of the work of scientists, the gas we use to-day is often a mixture of gases from other sources as well as coal.

In some parts of the world there is a lot of natural gas that is trapped deep under the ground. This gas is called methane.

About 1960, some men were drilling for natural gas and oil in the Sahara Desert. They found a huge pocket of natural gas trapped underneath the sands of the desert at Hassi Er R'Mel.

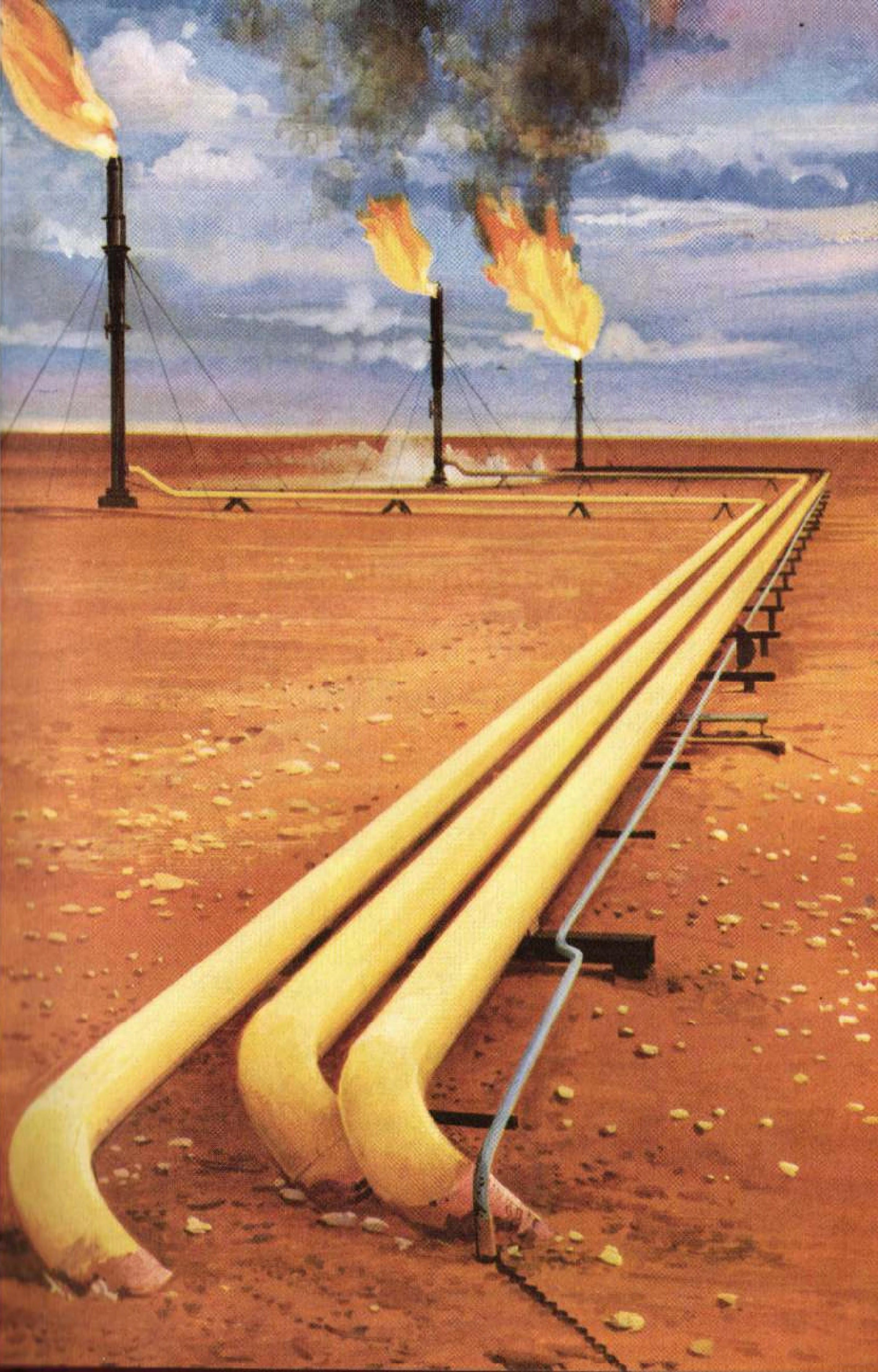
All this gas cannot be used in the Sahara Desert as no one lives there. People in other countries can use it and so a way of moving the gas to them had to be found.

The gas-field at Hassi Er R'Mel is two hundred and eighty miles from the Mediterranean Coast of North Africa.

The methane goes from the gas-field through a pipe-line to a small port called Arzew. The pipe-line goes over mountains and the gas in it is pushed along by more gas coming out of the ground.

People tried to think of a way of moving the gas from Arzew. It had to be taken across the sea.

An American named Prince found a way to turn the gas into a liquid so that it could be carried in ships.



At Arzew there are works where the gas is turned into a liquid. The works have many gleaming pipes and large tanks which are covered with ice. There is a tall chimney with a flame at the top burning unused gas. It does not need many men to run works like these.

The gas is made very cold and this turns it into a liquid. When it is a liquid the gas takes up less space. It would take six hundred tanks of methane gas to make one tank of liquid gas.

Ships have to be made in a special way to carry the liquid methane to our country. Two ships called the 'Methane Princess' and the 'Methane Progress' are used.

The liquid methane is kept very cold and the ships are like huge refrigerators. Because of the cold, metal like iron becomes brittle and breaks easily.

The methane tanks in the ships are made of aluminium. To help to keep the methane cold the tanks are covered with thick layers of balsa wood. These are called insulated tanks.

METHANE PRINCESS

When the tanks of the ship are full of liquid methane, the captain sets sail for England. He brings the tanker through the Mediterranean Sea and the Straits of Gibraltar. Then he sails up through the Atlantic Ocean and the English Channel.

The tanker docks at Canvey Island which is near the mouth of the River Thames.

The two tankers, the 'Methane Princess' and the 'Methane Progress', run a shuttle service from Arzew to Canvey Island. As one tanker sails full of liquid methane the other returns empty for another cargo.

At the docks at Canvey Island, men fix a pipe-line from the ship to special storage tanks. The liquid methane is pumped from the ship into the tanks. Each tank holds about two shiploads of liquid methane.

From the storage tanks the liquid methane goes through a process which changes it back to methane gas.

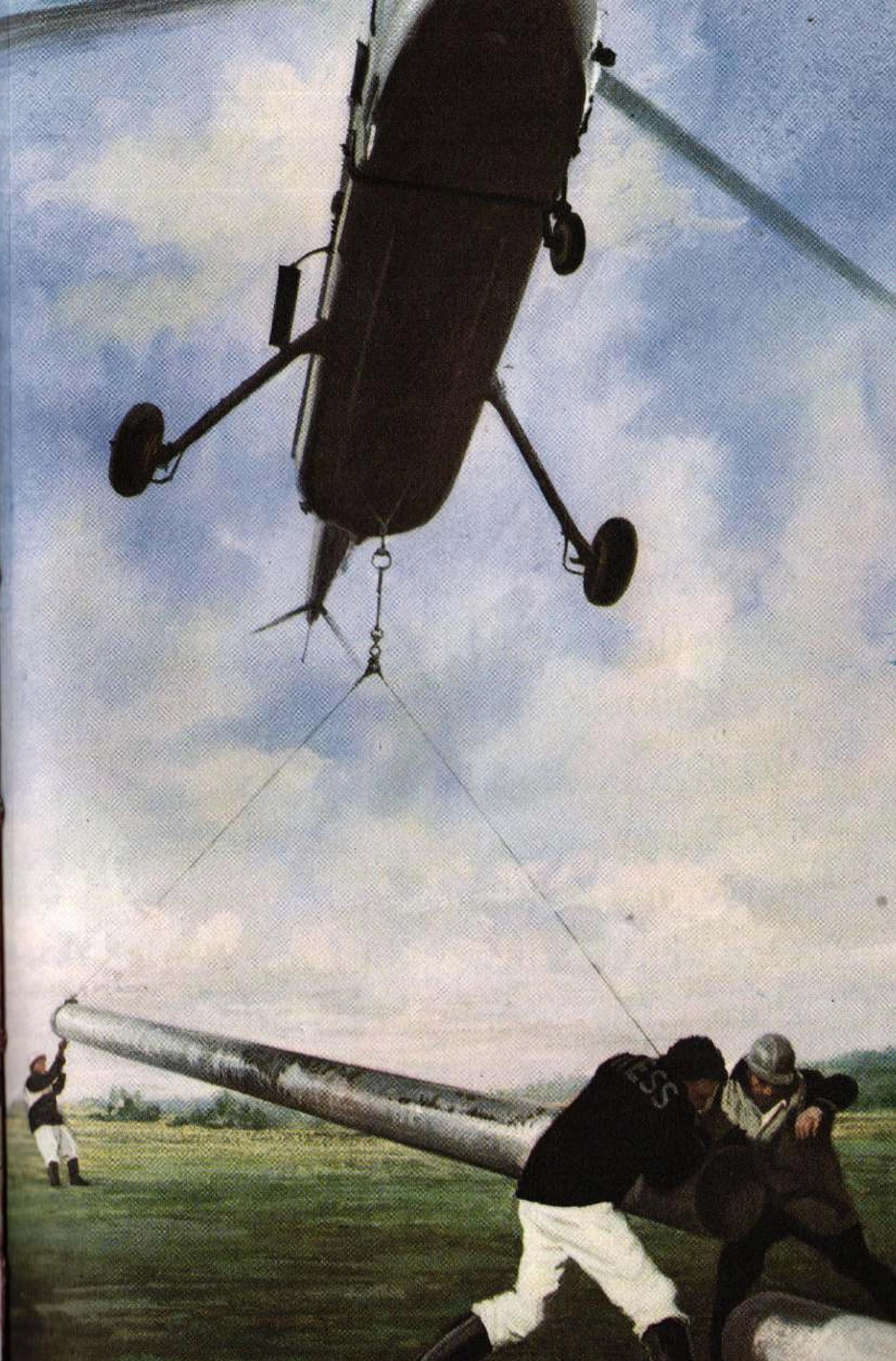
Then the gas has to be moved from Canvey Island to all parts of the country so that it can be used.

To do this a very long pipe-line called the super gas-grid has been laid.

The pipe-line has welded joints so that there will be no leaks. The pipes are eighteen inches wide and carry the gas at high pressure.

The super gas-grid goes as far north as Leeds. Thinner pipes take the gas to other towns. The super gas-grid belongs to the Gas Council. The Gas Council makes or buys all the gas used in our country.

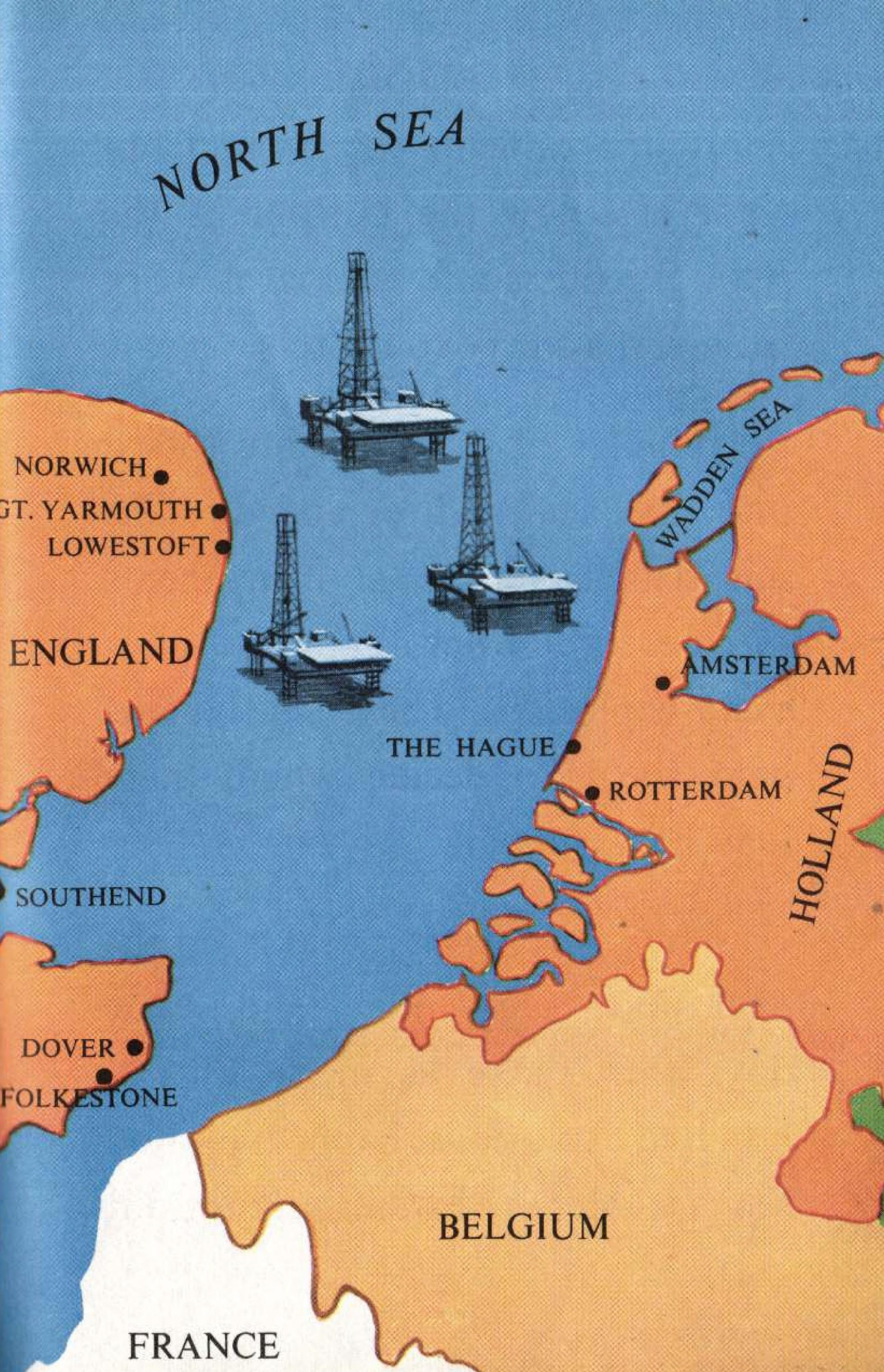
The gas is sold to the twelve Area Gas Boards. Men who work for the Area Gas Boards lay the pipes that bring the gas to our homes and factories.


ESS

A few years ago a huge field of natural gas or methane was found in Holland. Holland is just across the North Sea from England.

Geologists now know that a gas-field spreads under the North Sea towards England. Geologists are men who understand rocks and other things inside the earth. They are drilling into the sea bed to find the gas.

There are small natural gas-fields in Scotland and England. One of these is at Whitby in Yorkshire. The people of Whitby use the natural gas in their town. This gas-field is on the English coast of the North Sea.


NORTH SEA
WADDEN SEA
NORWICH
GT. YARMOUTH
LOWESTOFT
ENGLAND
AMSTERDAM
THE HAGUE
ROTTERDAM
HOLLAND
SOUTHEND
DOVER
FOLKESTONE
BELGIUM
FRANCE

It is a difficult job to find out what is below the bottom of the sea. Scientists and geologists work from ships to try to do this.

Bundles of dynamite are tossed into the sea and exploded. The scientists have special instruments to measure what happens after every explosion. These instruments help them to decide where there may be gas or oil.

The scientists make eight explosions every mile and some days they make as many as five hundred explosions. Every explosion sends a column of water into the air.

Scientists can only say where they *think* there might be gas or oil. To find out if there is gas, a hole has to be drilled in the earth at the bottom of the sea.

Special floating platforms are used to carry the drill. They are very large and have legs of steel standing in the air. These platforms are towed to the place where a hole is to be drilled.

When the platform is over the drilling-place, men lower the legs into the sea. The legs rest on the earth at the bottom of the sea.

The drilling machinery is set up on the platform and the men begin to drill. The drill is kept working all the time. The workmen and all the things they need are taken to the platform by ships or helicopters.

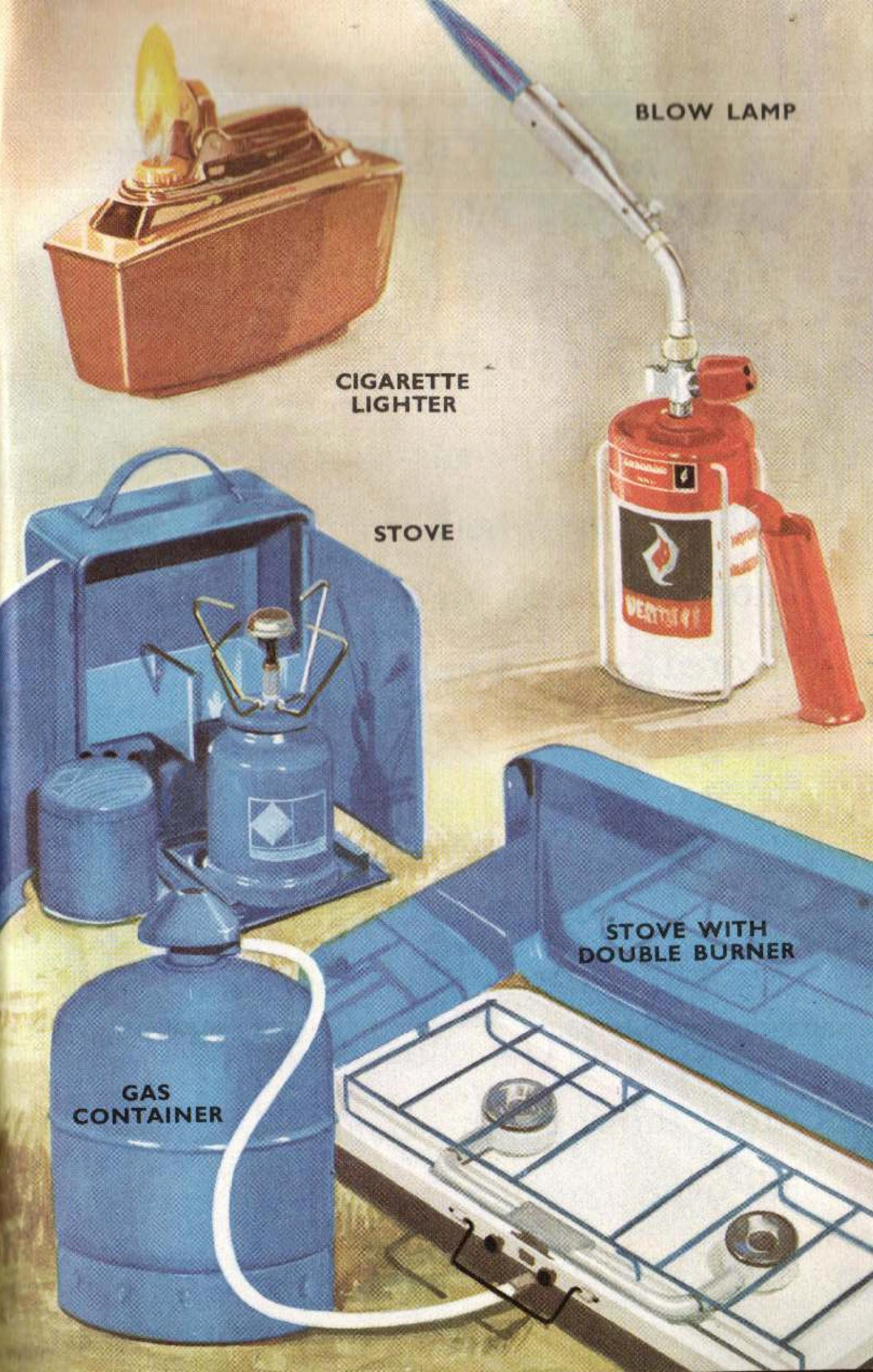
Sometimes the drills have to make a hole ten thousand feet into the earth before gas is found.

When gas is found, a special cap is fixed over the hole. Pipes are laid on the bottom of the sea to take the gas to the nearest land.

All the time, scientists are trying to find cheaper ways of making gas. A lot of gas is now made from oil. The oil is heated and as it gets warmer different gases are made.

Two of these gases, called butane and propane, are sometimes put into steel bottles. These gases can then be used where there is no piped supply. You may have used one of these gases in a picnic stove.

The Gas Council use an oil-gas called naphtha. This can be made cheaply and is easily made into town gas.

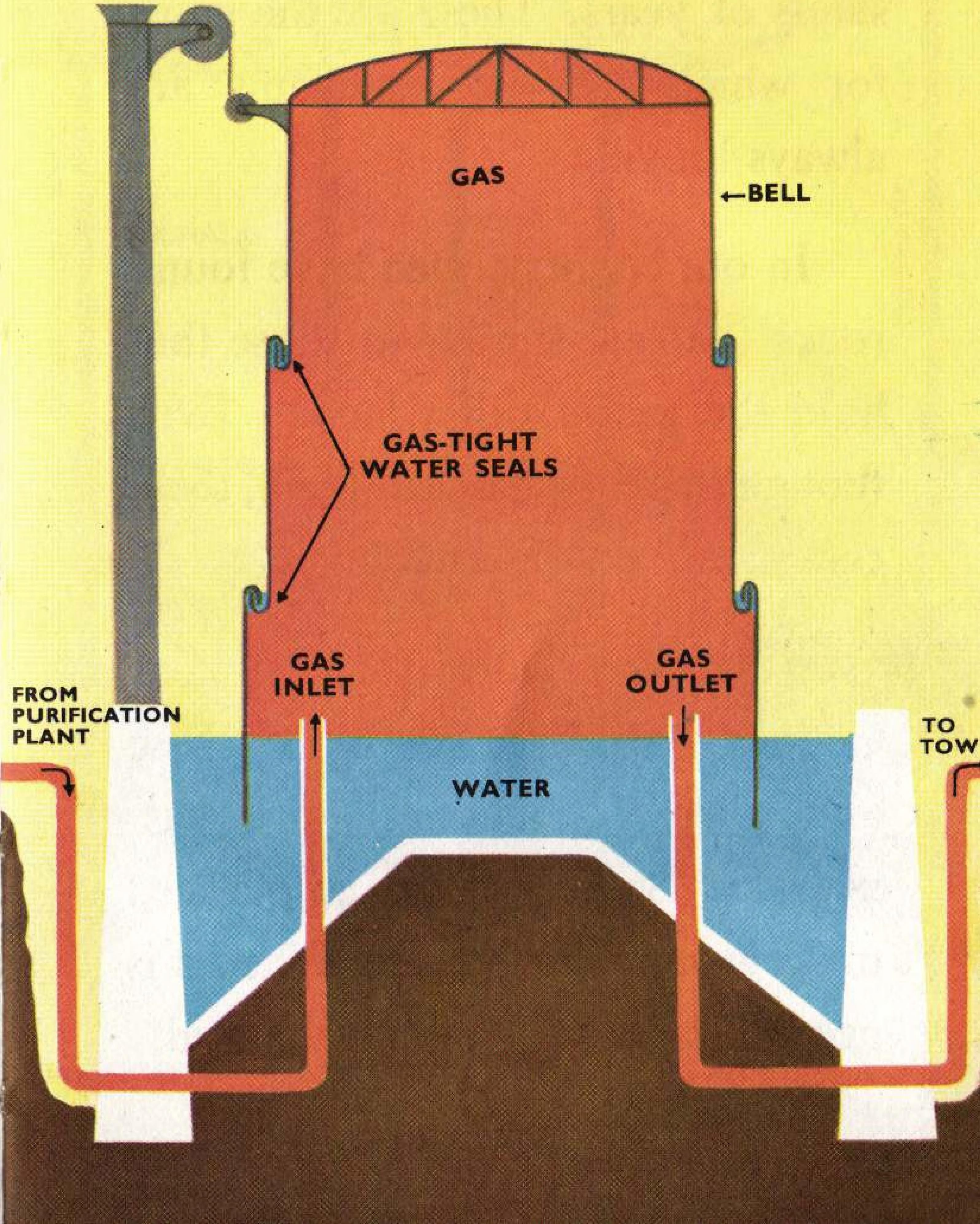

BLOW LAMP
CIGARETTE LIGHTER
STOVE
STOVE WITH DOUBLE BURNER
GAS CONTAINER

Because gas is used for heating and cooking, many people need it at the same time. A lot of gas is needed just before dinner-time.

Men at the gas-works make gas all the time whether it is needed or not. The gas that is not used is stored in gas-holders until it is needed.

Many of the gas-holders rise high above the ground when they are full and sink lower as the gas is used. The Gas Boards have over three thousand gas-holders in towns all over the country.

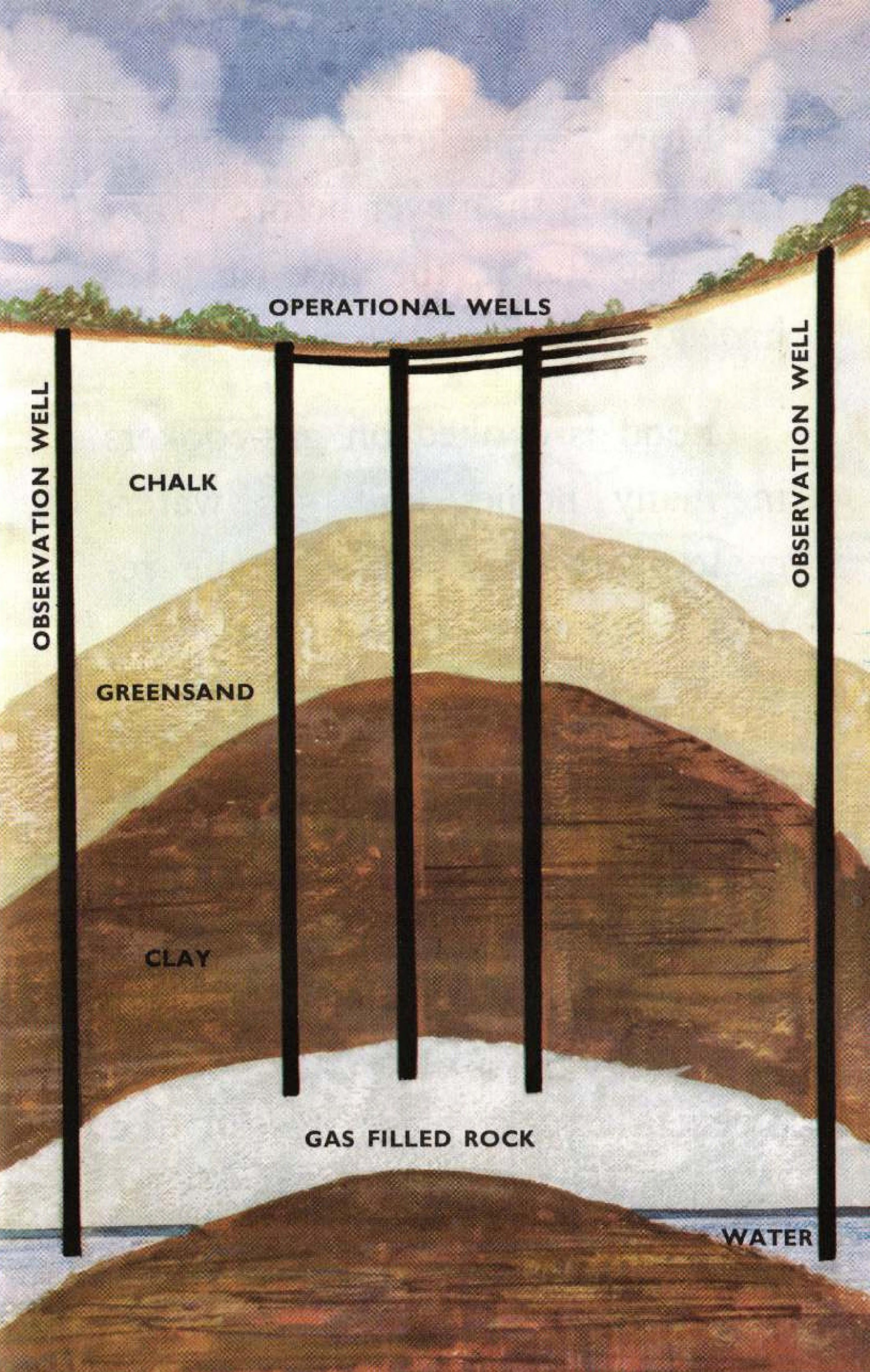
AS PURIFIED GAS ENTERS BETWEEN THE WATER-TANK AND BELL, THE BELL RISES AND THE GAS-HOLDER LENGTHENS LIKE A TELESCOPE



Natural gases like methane have remained underground for thousands of years. These are the gases for which the drilling teams are always looking.

In our country, men have found rocks that are similar to those that hold the gas in other lands. Even though there is no gas in them, these rocks can be very useful.

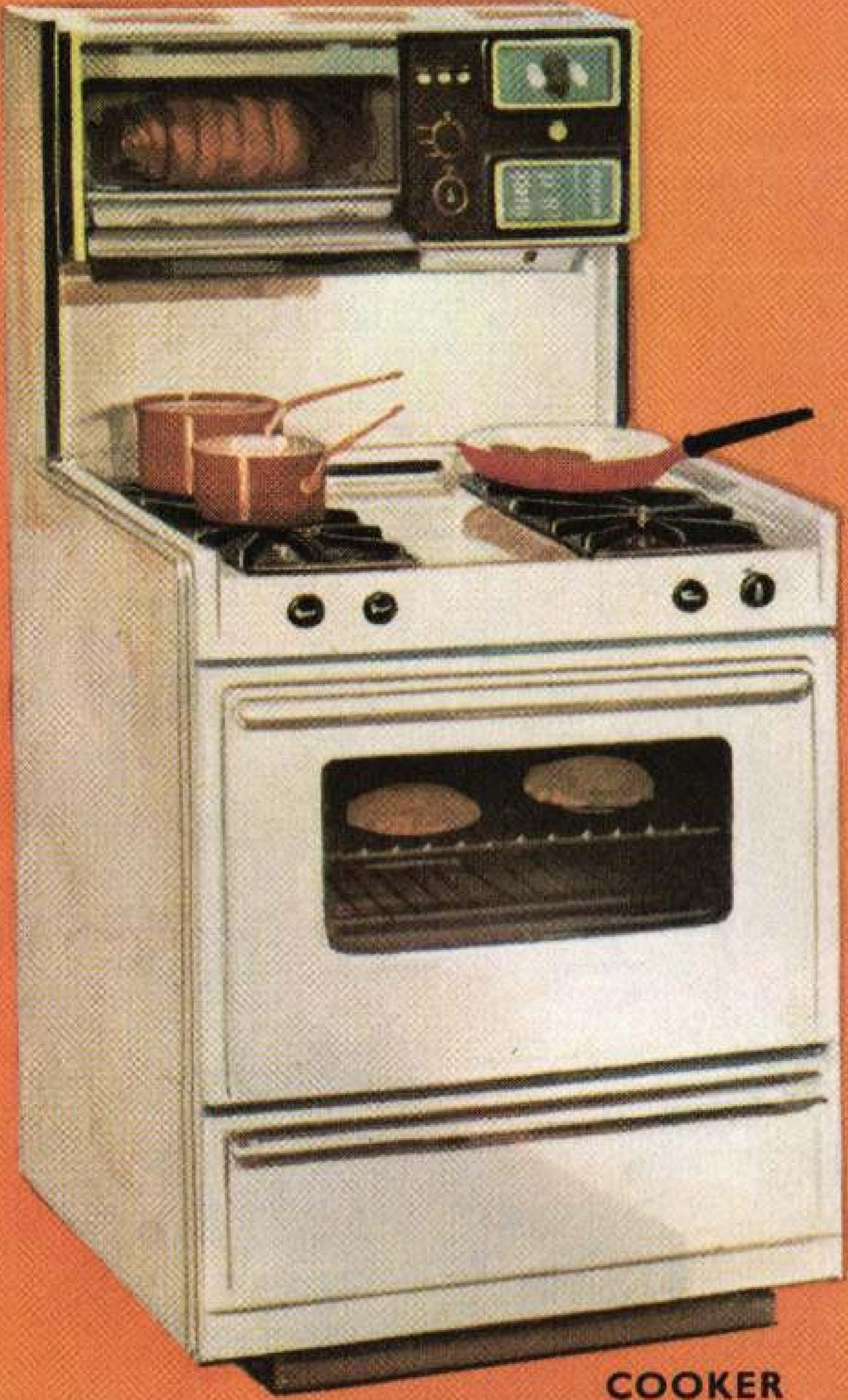
Men who work for the Gas Council have decided to use these underground rocks as huge gasholders. Spare gas can be pumped underground and stored. When it is needed it can be put into the grid.


OPERATIONAL WELLS
OBSERVATION WELL
OBSERVATION WELL
CHALK
GREENSAND
CLAY
GAS FILLED ROCK
WATER

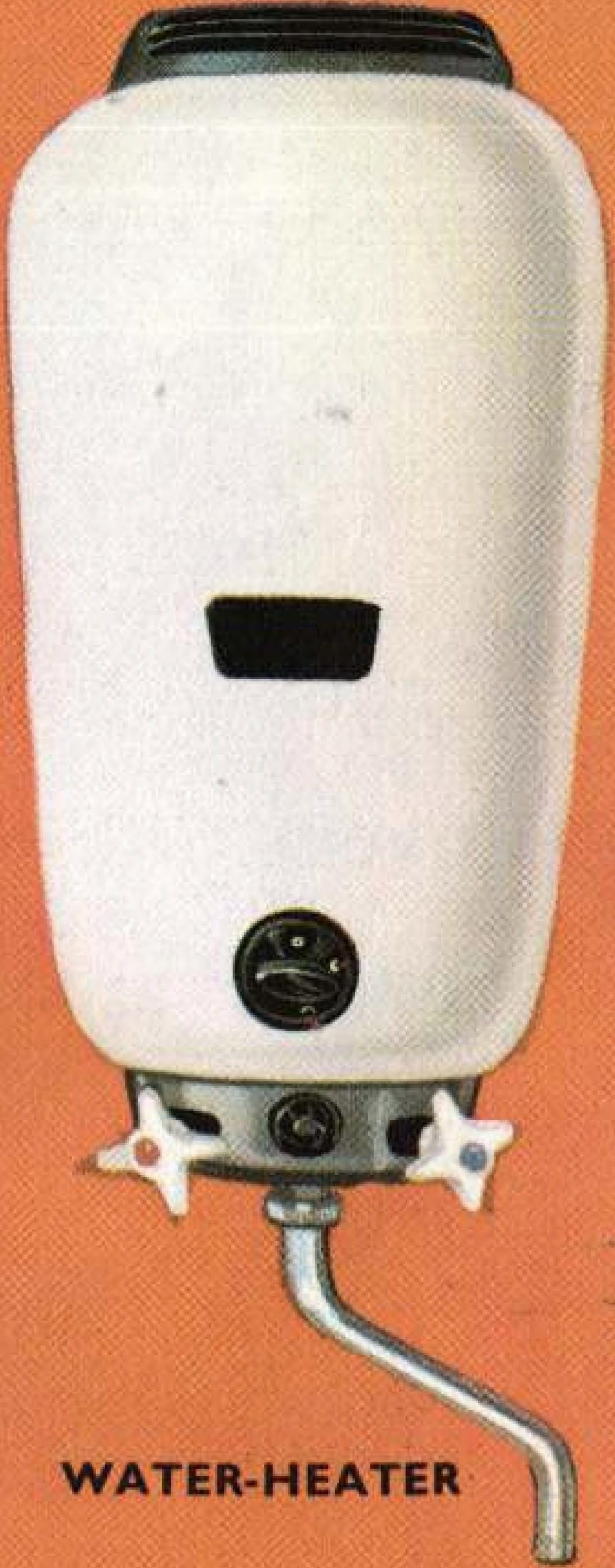
More people are using gas in their homes than ever before. They now use it for the heat it gives instead of for lighting.

Food is cooked on gas-cookers in many homes and gas water-heaters are used. Even some refrigerators are worked by gas.

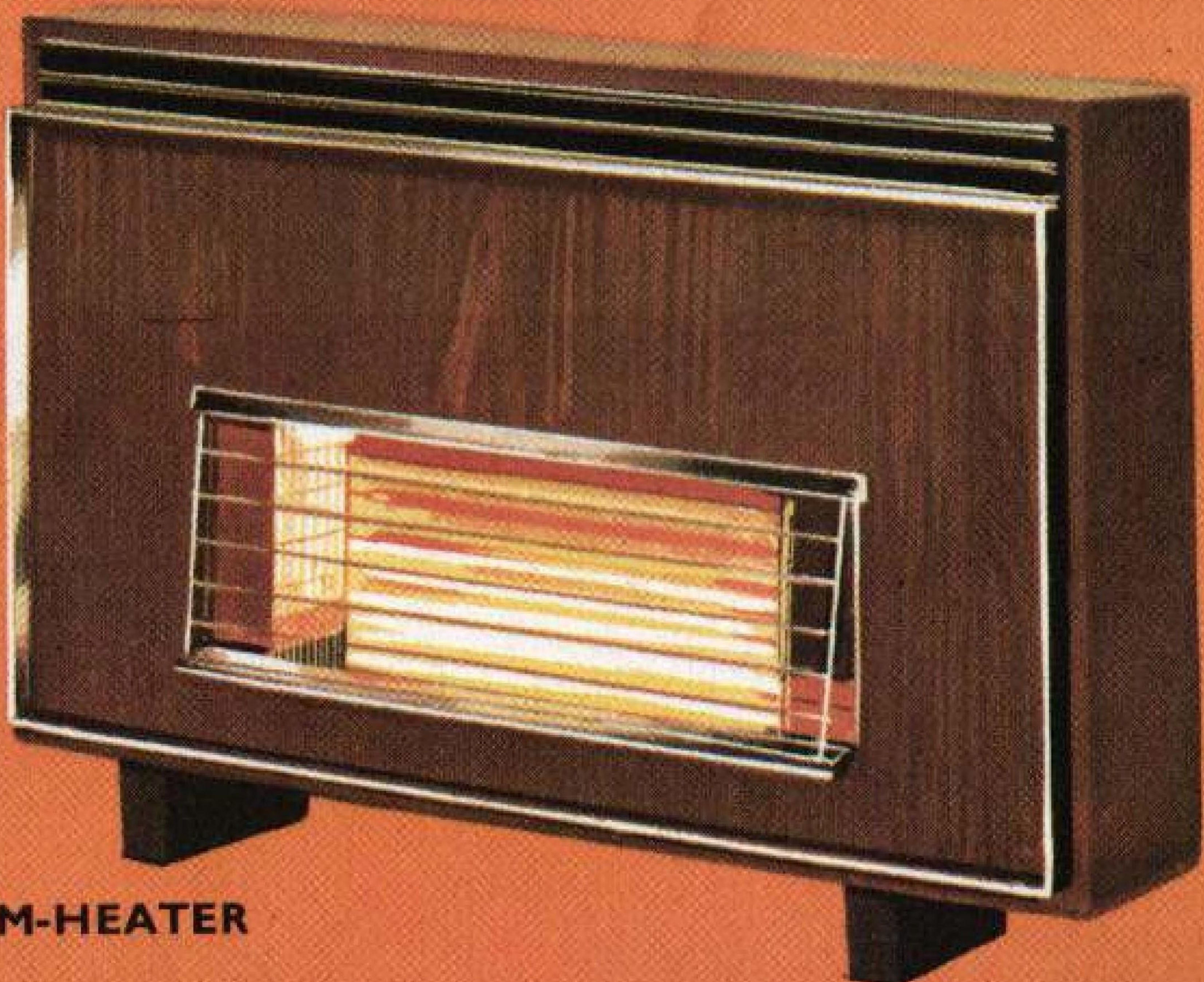
Gas-fires are used to warm rooms. Some people have gas-heated boilers which heat the water for radiators to warm the rooms. In newly built houses and flats, air can be warmed by gas-heaters and blown through pipes to all the rooms.



COOKER



WATER-HEATER



ROOM-HEATER

Gas is used for many purposes in factories as well as in homes.

Some of the bread and biscuits that we eat are baked in gas-fired ovens. Many of our chocolates and sweets are made in factories that use gas.

Gas is used in potteries and for making glass. It is also used for making television tubes and light bulbs and for drying paint on cars.

Gas is useful to men at work as it can give a hot flame or a gentle warmth. It is even used for ripening bananas.

7

In most towns, the Area Gas Boards have Gas Showrooms. Some of the men and women who work there collect the money from people paying gas bills.

Other men and women help people to choose cookers or any of the other things that work by gas.

The Gas Council has its own testing works. Before being sold, all the things that use gas are tested by men who work there. This is to make sure that fires, cookers, boilers and other things are safe to use and will work well.

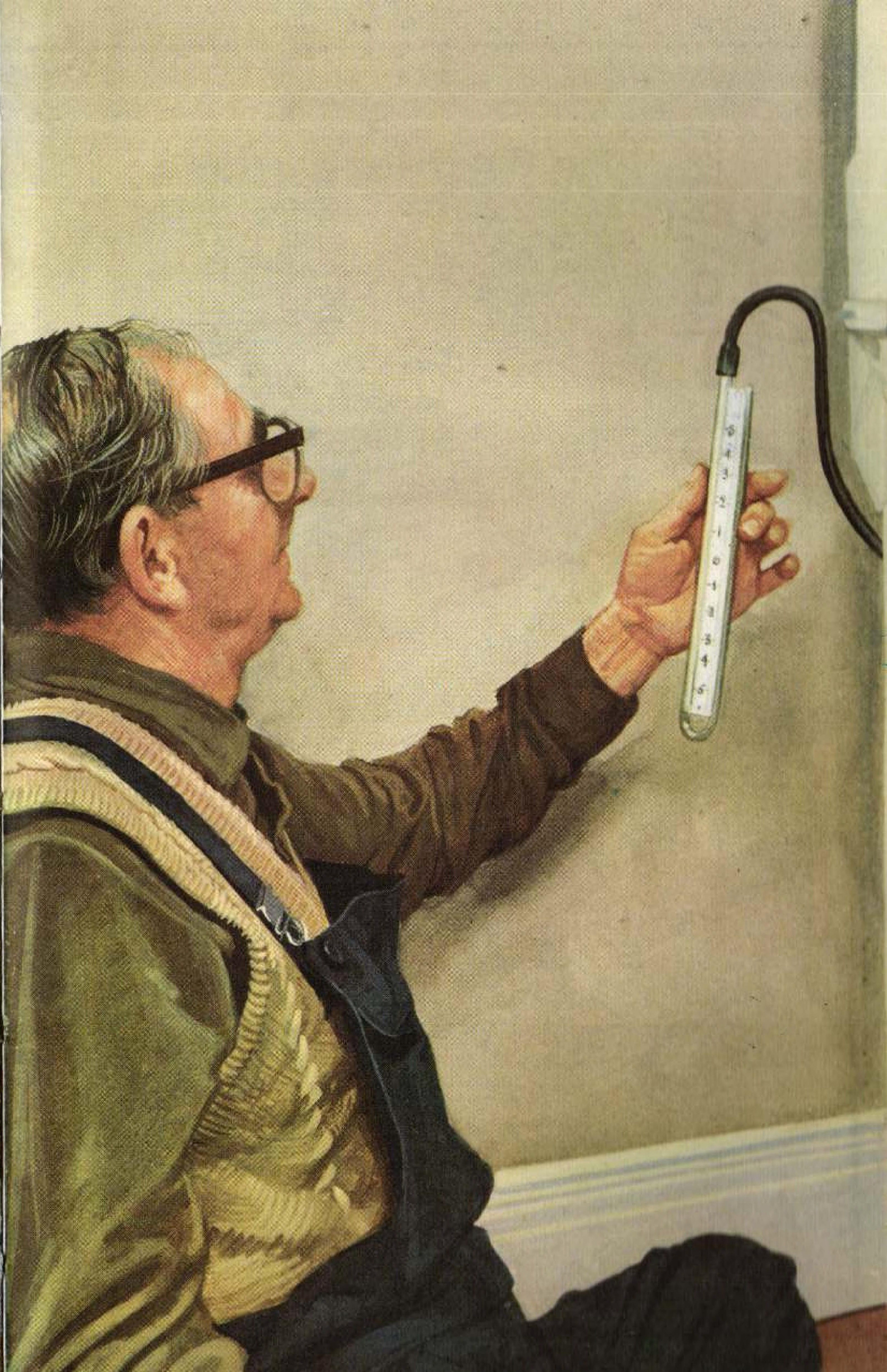
WA

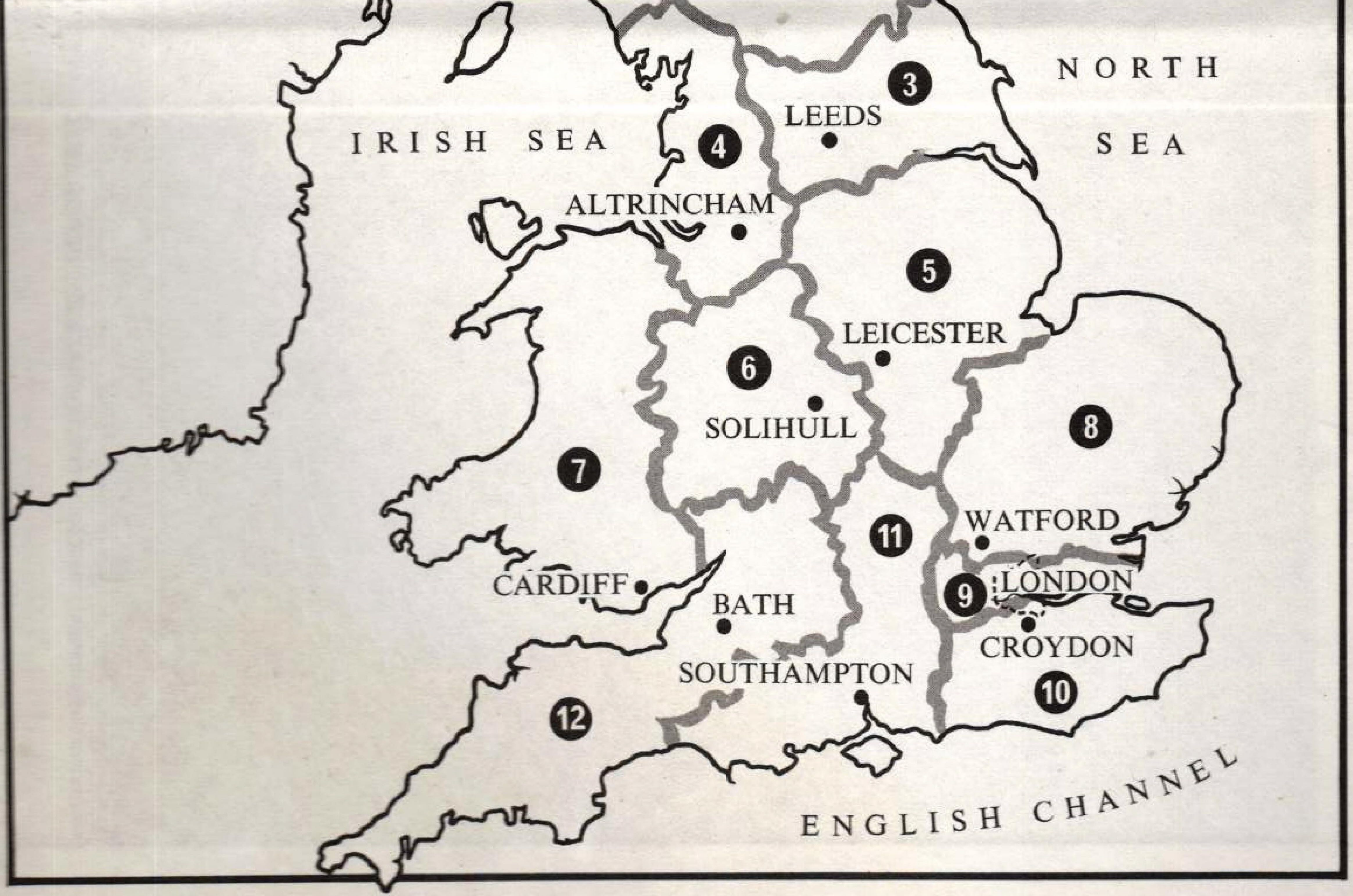
Many of the new gases have no smell. This could be dangerous. If there was a gas leak no one would know about it and there could be an explosion. To make gas smell, a chemical called 'Tetra Hydro Thiophen' is put in it.

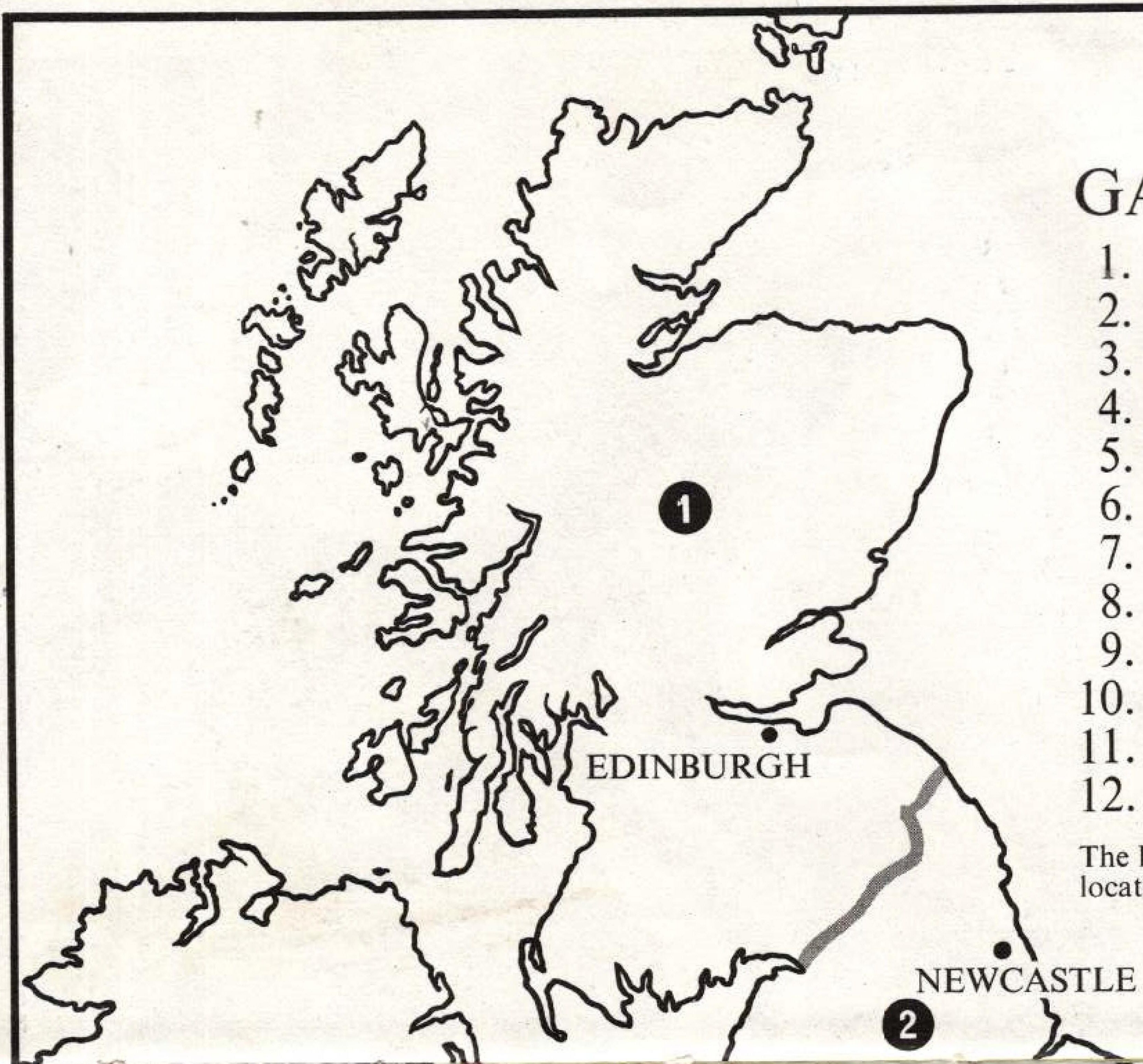
If you smell gas, open all the windows and turn off all gas-taps.

Never look for a gas leak with a match or naked light.

If you think there is a gas leak, 'phone the Gas Board. They will always be pleased to send a man to help you. He has a safe way of finding leaks.


5
4
3
2
1
0
1
2
3
4
5


NORTH SEA
IRISH SEA
3
LEEDS
4
ALTRINCHAM
5
LEICESTER
6
SOLIHULL
7
8
CARDIFF
BATH
11
WATFORD
9
LONDON
CROYDON
SOUTHAMPTON
10
12
ENGLISH CHANNEL



AREA GAS BOARDS

1. Scottish
2. Northern
3. North Eastern
4. North Western
5. East Midlands
6. West Midlands
7. Wales
8. Eastern
9. North Thames
10. South Eastern
11. Southern
12. South Western

The Boards' Headquarters are located in the towns shown •

List of titles in Series 606E (The Public Services)

1 *Electricity*

2 *Gas*

There are now over 180 Ladybird titles covering a wide range of subjects and reading ages. Write for an illustrated catalogue from the publishers

WILLS & HEPWORTH LTD
Loughborough Leicestershire England